# CSO Control Program Overview and Green Infrastructure Update

## A Focus on Water Quality

Jim Theiler, City of Omaha

Post-Construction
Stormwater Management Workshop
March 21, 2013

CSO! Clean Solutions for Omaha

## Presentation Outline

- CSO Program Overview
- Current Green Infrastructure Activities
- Path Forward

CSO! Clean Solutions for Omaha

## CSO Program Overview

CSO! Clean Solutions for Omaha

## Challenges Facing Omaha

- Meeting the increased requirements of the federal Clean Water Act
- Balancing the following needs:
  - Regulatory compliance
  - Economic affordability
  - Community acceptance


CSO! Clean Solutions for Omaha

## Omaha's Regional Sewer System

- **1,950 miles of sewers**
  - Eastern third combined
  - Western third separate
- **43 sq. mi combined sewer area**
  - 28,000 acres
  - 6,200 sq. blocks
- **29 CSO outfalls**
  - 10 to Papio Creek
  - 19 to Missouri River
  - **3 recently eliminated**
  - **5 to be eliminated in next few years**


CSO! Clean Solutions for Omaha

## Omaha's Regional Sewer System

- Two regional treatment plants
- 10 wholesale users
- 275 sq. mi drainage area
- 600,000 service population (approx.)


CSO! Clean Solutions for Omaha

## CSO Overflow Statistics

Total wet weather volume:
8.2 Billion Gallons/year

Total untreated volume:
3.5 billion Gallons/year
Missouri River = 2.8
Papio Creek system = 0.7

Computer model estimates, typical year prior to start of CSO program, typical rainfall patterns with average annual precipitation of approx. 30". (Photo of dry weather overflow, Elm Creek)

## CSO Consent Order Timeline


## Program Benefits

- Reduce overflows of raw sewage to our streams; improve water quality
- Continue to minimize basement backups
- Replace aging sewer, gas, water and street infrastructure

(Photo of Leavenworth CSO 109 after rain event)

## Program Benefits

- Integrate infrastructure upgrades with continued redevelopment
- Improve drainage and reduce flooding

## PROGRAM COSTS (2009 dollars)

| Project Category | Program Cost |
|---|---|
| Deep Tunnel Project ** | $ 442,000,000 |
| Minne Lusa Stormwater Collector Projects | $ 113,000,000 |
| High Rate Treatment Projects | $ 126,000,000 |
| South Interceptor Force Main Project | $ 77,000,000 |
| MRWWTP Improvements | $ 91,000,000 |
| Lift Station Projects | $ 131,000,000 |
| Storage Structure Projects | $ 31,000,000 |
| Sewer Separation Projects | $ 614,000,000 |
| Miscellaneous Projects | $ 36,000,000 |
| **GREEN** | **$ ?** |
| **TOTAL** | **$ 1,661,000,000** |

Estimate 2012 costs $1.96 billion

## Green Solutions (Green Infrastructure)

- Utilize green solutions to:
  - Enhance the project aesthetics
  - Reduce wet weather impact on the system
  - **Reduce costs**
  - Provide neighborhood benefits

## Current Green Infrastructure Activities

## CSO Green Capital Projects Status

- Aksarben Village Neighborhood

(Elmwood Park bioretention/storm water diversion)

Work in the park substantially complete

## CSO Green Capital Projects Status (cont.)

- Saddle Creek - 55th to 64th (stream diversion from CSS, wetlands and detention, open channel creation) – under construction

## CSO Green Capital Projects Status (cont.)

- Spring Lake Park (multi use pond, constructed wetlands and water quality basins) - 60% Design review completed, NET Phase 4 Grant recommended for award

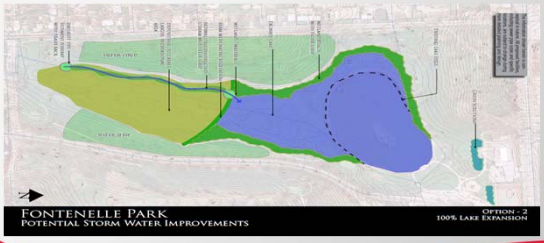

## CSO Green Capital Projects Status (cont.)

- Adams Park (wetlands, storage, water quaility)

Beginning final design

## CSO Green Capital Projects Status (cont.)

- Fontenelle Park Improvements ( lake improvements, open channel creation?? ) – preliminary design



## CSO Green Capital Projects Status (cont.)

- Forest Lawn (stream diversion from CSS, proposed lake for storage) – RFP for Design consultant to be issued soon

## CSO Green Capital Projects Status (cont.)

- All capital projects in the CSO are evaluated for inclusion of Green
- Must be cost effective

  Working to achieve multiple benefits and save money for the ratepayer!!

## EPA Partnerships

- Office of Water Community Partners Project
- Office of Research and Development/Region 7 Soils Study/USGS Monitoring follow up
- Urban Waters Grant, Saddlebrook Neighborhood and Benson area

## Other Green Infrastructure Activities and supporting efforts

- Series of internal workshops to educate broader cross section of City Staff (this spring)
- Continue to focus on more collaborative efforts between CSO Program and Storm Water/MS4 Program

## Other Green Infrastructure Activities and supporting efforts (cont.)

- Pilot demonstration projects looking at Green to support CSO
  - SE Police Precinct WERF Study pervious pavement retrofit for volume control
  - 50th and Pine firehouse pervious pavement with volume control
  - Sewer Maintenance Facility bioretention and Pave Drain installation (USGS monitoring site)

## Other Green Infrastructure Activities and Supporting Efforts (cont.)

- Upgrade to City of Omaha GIS in the CSO area to better support delineation of pervious/impervious surfaces (May 2013)
- Upgrading stormwater component of City of Omaha CSO computer model – will better support watershed/green alternative modeling (late fall 2013)
- Selection of Consultant (Tetra Tech) to work with City of Omaha CSO Program Management - reevaluation of Green for the CSO Program

## Path Forward


## Path Forward (cont.)

- CSO LTCP update required by permit , October 2014. Will include additional **COST EFFECTIVE** Green Infrastructure with 2014 update or in subsequent updates or addendums
- City will continue to work in collaboration with NDEQ and EPA. **Making our regulators our partners has lead to the success of the CSO Program**.

## Path Forward (cont.)

- Continue to focus efforts to educate ourselves, our stakeholders, and the community
- Challenge engineering community to rethink stormwater management . Control water at its source.
- Develop/incorporate cost effective, maintainable standard designs, implement additional demonstrations and pilot studies

## Contact Information:

Marty Grate – City of Omaha, Environmental Services Manager, mgrate@ci.omaha.ne.us

Jim Theiler – City of Omaha Public Works, CSO Program, jtheiler@ci.omaha.ne.us
(402) 444-4923

Nina Cudahy – City of Omaha, Stormwater Program Manager, ncudahy@ci.omaha.ne.us

## EXTRA SLIDES

## It's All About Money!

"We must continue to look for better ways to implement the CSO Program and prepare ourselves to meet future requirements of the CWA. We have a duty to our ratepayers and to the community to meet our water quality objectives in the least cost and most fiscally responsible manner."

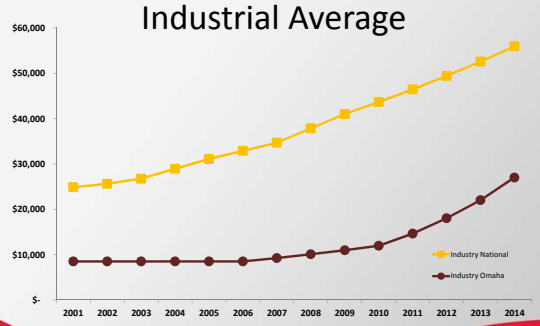
## EPA Office of Research and Development/ Region 7/USGS Partnership

- City reached out to EPA to form collaborative partnership
- 14 sites selected by City Staff for field investigation by ORD/USGS
- Field investigations completed in July 2012
- Draft report received by City
- Follow on activities include demonstration site with USGS monitoring

## It's All About Money!

"We must continue to look for better ways to implement the CSO Program and prepare ourselves to meet future requirements of the CWA. We have a duty to our ratepayers and to the community to meet our water quality objectives in the least cost and most fiscally responsible manner."

## Omaha versus National Industrial Average



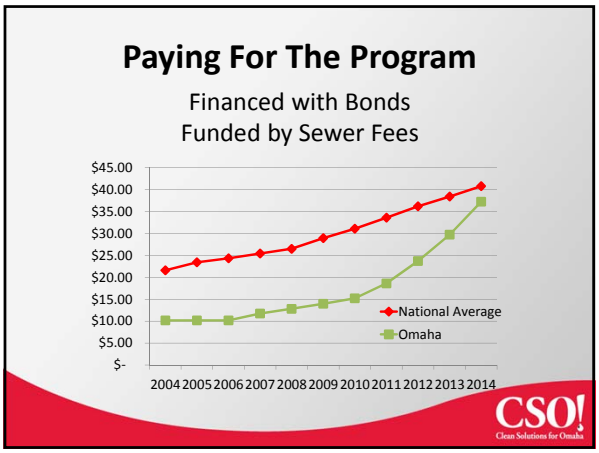

## CSO PROGRAM COSTS

## Green Solutions (Green Infrastructure)

- Utilize green solutions to:
  - Enhance the project aesthetics
  - Reduce wet weather impact on the system
  - **Reduce costs**
  - Provide neighborhood benefits

## Green Solutions (Green Infrastructure)

- Utilize green solutions to:
  - Enhance the project aesthetics
  - Reduce wet weather impact on the system
  - **Reduce costs**
  - Provide neighborhood benefits


Paying For The Program
Financed with Bonds
Funded by Sewer Fees
$45.00
$40.00
$35.00
$30.00
$25.00
$20.00
$15.00
$10.00
$5.00
$-
2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014
National Average
Omaha
CSO!
Clean Solutions for Omaha